

2013 VIREC Database and Methods Cyber Seminar Series



Ascertaining Veterans' Vital Status and Dates of Death:

The VHA Vital Status File and Other Data Sources for Mortality Ascertainment in VA

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Session Objectives

- **At the conclusion of the program participants will be able to:**
 - Identify data sources for Veteran vital status ascertainment
 - Understand the contents and structure of the VA Vital Status Files and their appropriate use for mortality ascertainment
 - Describe the respective strengths and limitations of available VA data sources for mortality ascertainment.

Session Topics

- **Data sources for Veteran vital status ascertainment**
- **VHA Vital Status Files**
 - Structure and contents
 - Challenges in using the VHA VSF
- **Where to go for more help**

Audience Poll

(Heidi convert to poll)

■ How would you rate your knowledge of methods to ascertain death dates for Veterans in the VA?

- 1 (No knowledge)
- 2
- 3
- 4
- 5 (Expert)

■ Have you ever used the VHA VSF?

- 1 Yes, including the Master File
- 2 Yes, Only the Mini File
- 3 No

Session Topics

■ Data sources for Veteran vital status ascertainment

- Included in VHA Vital Status Files
- Other sources

■ VHA Vital Status Files

- Structure and contents
- Challenges in using the VHA VSF

■ Where to go for more help



BIRLS Death File

- Veterans Benefits Administration (VBA) **B**eneficiary **I**dentification and **R**ecords **L**ocator **S**ystem (BIRLS) database extract
- **Information sources:**
 - Family
 - VHA hospitals
 - VA National Cemetery Administration
 - Social Security Administration (SSA)
- **Coverage:** Veterans known to VA
- **Updates:** Monthly (complete overlay)
- **Location:** Austin Information Technology Center (AITC)

VA CMS Vital Status File

- Received from Centers for Medicare & Medicaid Services (CMS) annually
- **Information sources:**
 - SSA
 - Medicare claims
 - Other (e.g., family)
- **Coverage:** Veterans enrolled in Medicare (≥ 65 years old or disabled)
- **Updates:** Annual
- **Location:** Available from VIREC

Data through
March 2013
received,
available soon



SSA Death Master File

- Social Security Administration
- **Information sources:**
 - Multiple, incl. family members, funeral directors, post offices, financial institutions, other federal agencies, state vital records agencies
- **Coverage:**
 - Individuals with SSN (first issued 1936)
 - Includes deaths occurring outside United States
 - More complete for over 65 population and for beneficiaries^{1,2}
- **Updates:**
 - Weekly (and VA receives annual overlay)
- **Location:** AITC



Patient Treatment File

- **Information source:** VistA PTF File (#45), Date of Disposition (DISDAY) and Type of Disposition (DISTYPE) fields
- **Coverage:** Inpatient deaths
 - VA hospitals
 - Non-VA when covered by VA (Fee Basis)
- **Updates:** Weekly
- **Location:** AITC (MedSAS); CDW

Coming!

National Cemetery Administration

- **Information sources:**

- Multiple, incl. families

- **Coverage:**

- Veterans who applied for burial benefits

- **Updates:**

- Monthly

- **To be incorporated into Master Veteran Index (MVI)³**

NCA death
data to be
incorporated
into VHA VSF
soon

OTHER AVAILABLE SOURCES

(Not in VHA VSF)

VA Corporate Data Warehouse

■ SPatient.Spatient Table

■ Columns:

- DateofDeath
- DateOfDeathText
- Deceased
 - Flag set to 'Y' if there is information in the DateOfDeathText column and 'N' if DateOfDeathText column is empty.

VA Corporate Data Warehouse

- **Source:** VistA Patient File (2), Date of Death Field (.351)
- **Current policy: Information to be entered from “official sources” only***
 - VHA facility (if patient died in the VHA facility or while under VA auspices)
 - Death certificate
 - National Cemetery Administration

* VHA Handbook 1906

VA Corporate Data Warehouse

Coverage*

- Incomplete (~ 30% not recorded)
- Has dates of death not in VHA VSF[†]
 - Patients in VSF: very recent deaths
 - Patients not in VSF: mostly due to no VHA/VBA activity after the end of FY 1991

*Information from recent analysis by the Data Quality Analysis Team, Office of Information and Analytics.

[†] >591,000 in this analysis



National Death Index

- **Available in** the Suicide Data Repository from the VHA Office of Public Health, Post Deployment Health Group (10P3A)*
- **Source:**
National Center for Health Statistics (State vital records agencies)
- **Gold standard for death ascertainment**

*Contacts: Robert Bossarte (Robert.Bossarte@va.gov), Director, Epidemiology Program, and Shanna Smith (shanna.smith@va.gov)



NDI Data in VA Suicide Data Repository

■ Coverage:

- VHA inpatient or outpatient users, FY1998 to FY2009 with no indication of being alive at time of search based on VHA utilization
- OEF/OIF Roster who were VHA enrollees, even if not user

■ Complete through end of FY2009

■ ~18-month lag

■ Includes cause of death

SSA Epidemiological Search

- **Provides date of death**
- **Validates SSN**
- **Provides 'presumed living' status**
 - Based on SSA administrative data including:
 - Payroll deductions, railroad retirement or disability payments, death claims filed by beneficiaries⁴
 - Advantage: Reduces loss to follow up
- **Deaths occurring outside the US**
- **Fees**

Session Topics

- Data sources for Veteran vital status ascertainment
- **VHA Vital Status Files structure and contents**
- Challenges in using the VHA VSF
- Where to go for more help

VHA VSF Background

■ Single sources are incomplete

Using the National Death Index as the gold standard^{5,6}:

DOD Source	Sensitivity ^{4,5}
BIRLS	64-80%
VA CMS	83%
SSA	89-95%
PTF	5-12%

(Savas, 2009; Sohn, 2006)

VHA VSF Background

VIReC VA-NDI Mortality Data Merge Project^{6,7}

- The combined use of the BIRLS Death File, the SSA Death Master File, the Medicare Vital Status File and inpatient Medical SAS data compared very favorably with the results of a NDI search.
- Use of external sources (SSA DMF and Medicare Vital Status File) increased the number of deaths identified by 22.4% over the use of only internal sources (BIRLS Death File and MedSAS data).
- Recommended the creation of a new VA file of combined mortality data

VSF Available in 2006

■ Owner

- Built by National Data Systems (NDS)
- First available in October 2006

■ Data access information

- See VHA Data Portal website

■ Updated quarterly

■ Veterans known to VA

- VHA activity FY 1992 or later

■ Two files + conversion file

- Master, Mini, scrambled → real SSN

Vital Status Files

Master

- Veterans and non-veterans
- One record per SSN/DOB/Sex combination
- 122 variables*

Mini

- Veterans
- One record per SSN
- Combined data from multiple Master records
- 16 variables*

* VSF created 4/28/2013

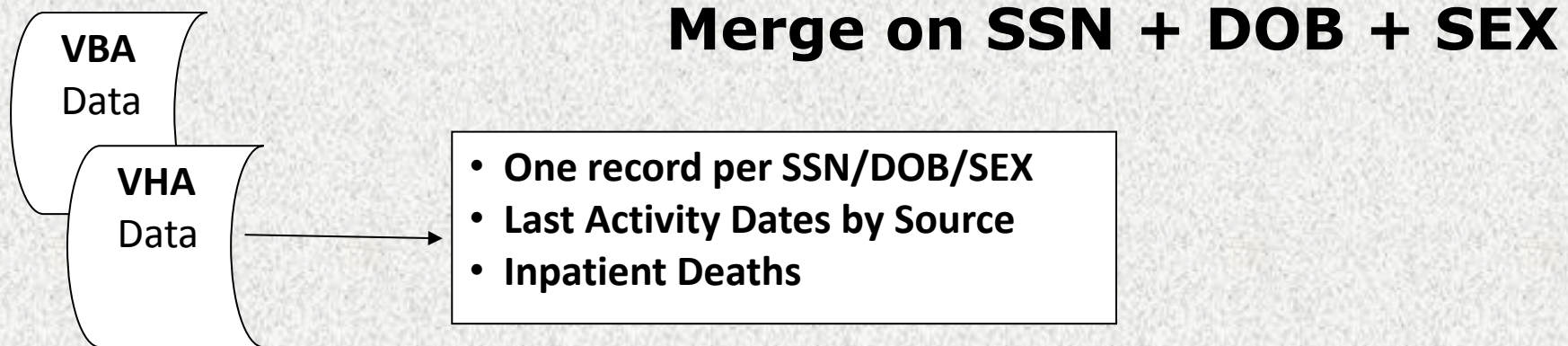


Construction of the VHA VSF

NDS Methodology

Construction of the Master File

Base Data Sources



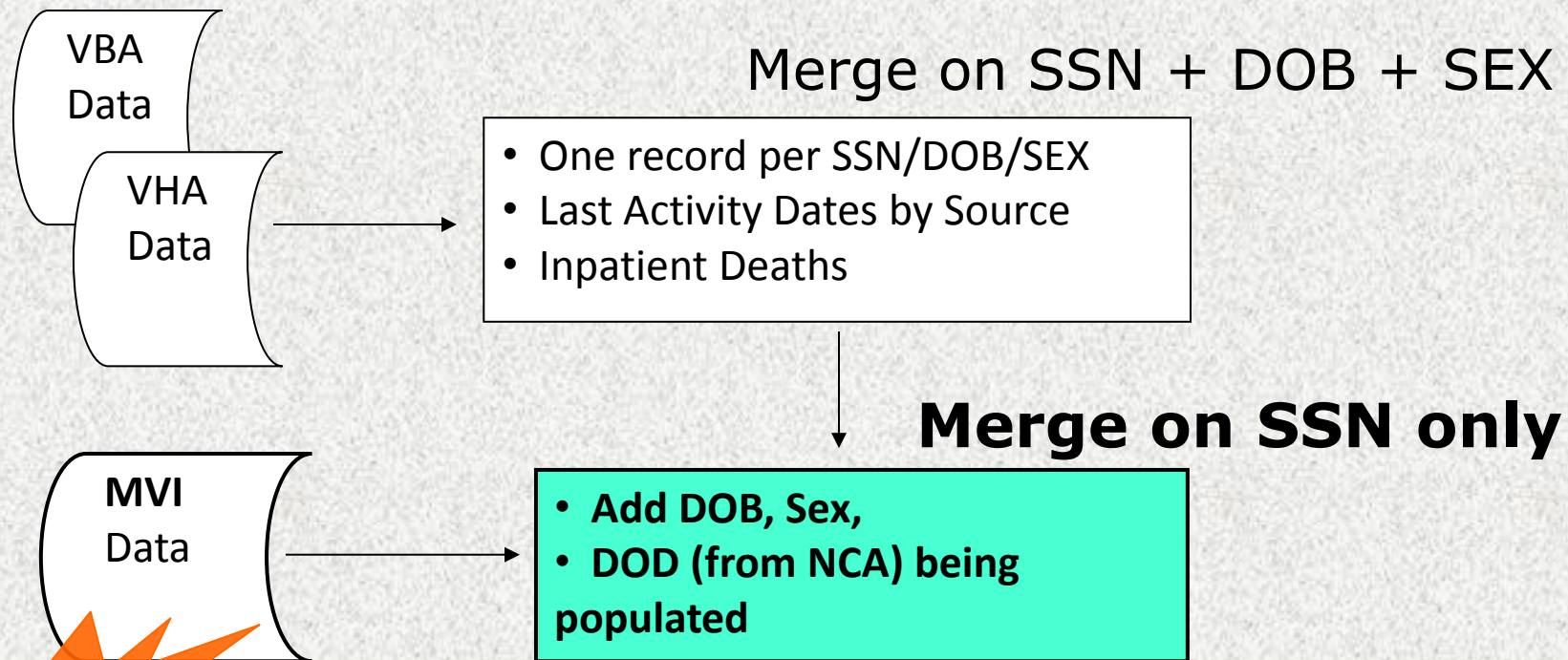
Data Sources for SSN/DOB/Sex Key Combinations

- Medical SAS Inpatient Datasets and Census (PTF)
- Inpatient and Outpatient Encounter (ENC)
- Non-VA care or Fee Files (FEE)
- DSS Pharmacy Files (DSS)
- Enrollment (ENR)
- Veterans Service Network Corporate Mini Master File (VETSNET)

Construction of the Master File

Supplemental Data Sources: MVI

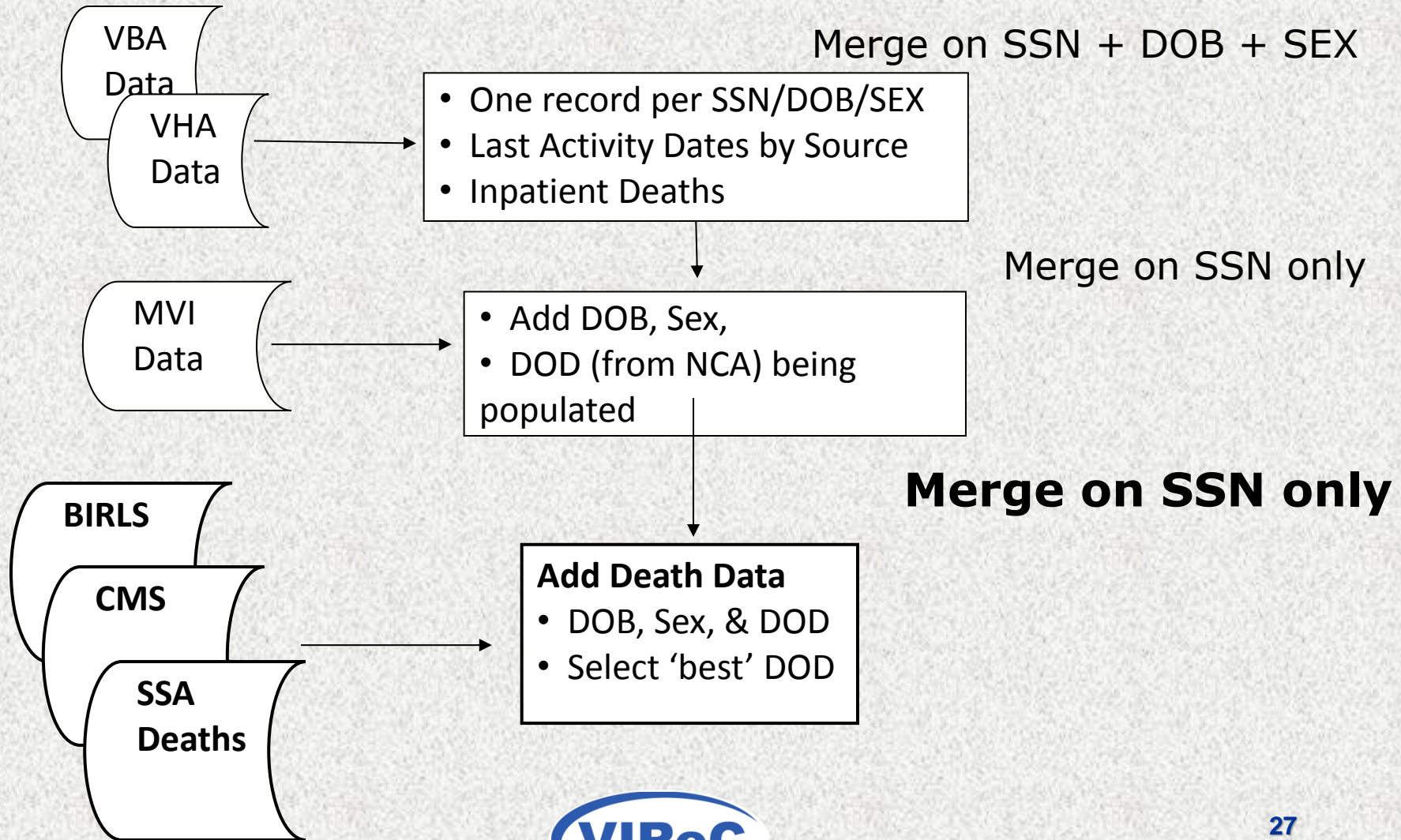
Master Veteran Index⁶



MVI added
in 2013

Construction of the Master File

Supplemental Data Sources



Construction of the Master File

Add Death Data from External Sources

- **CMS Medicare data**
- **SSA Death File**
 - Does not contain sex data
- **BIRLS Death File**
- **Matched to VA data on SSN only**
- **Demographics (DOB and Sex) and DOD**

Structure and Contents of the Master File

- **One record for each VA SSN/DOB/SEX combination**
- **DOB and SEX** – Each record has:
 - One set of DOB/Sex variables for each source of VSF data on the record
 - All VA source variables have the same DOB/Sex
 - BIRLS, Medicare, and SSA matched on SSN only and may have different DOB and/or Sex
- **Dates of death and 'best' DOD**
 - From Medicare, BIRLS, Inpatient (PTF & FEE), and SSA
 - See Appendix A

Contents of the Master File

■ Last Activity Dates

- VA sources and Medicare
- Two Medicare last activity dates, one w/out DME and unpaid carrier claims
- Veteran Flags
- Based on means test variables and other veteran indicators
- Outpatient, Inpatient, Enrollment, and Compensation and Pension

Contents of the Master File

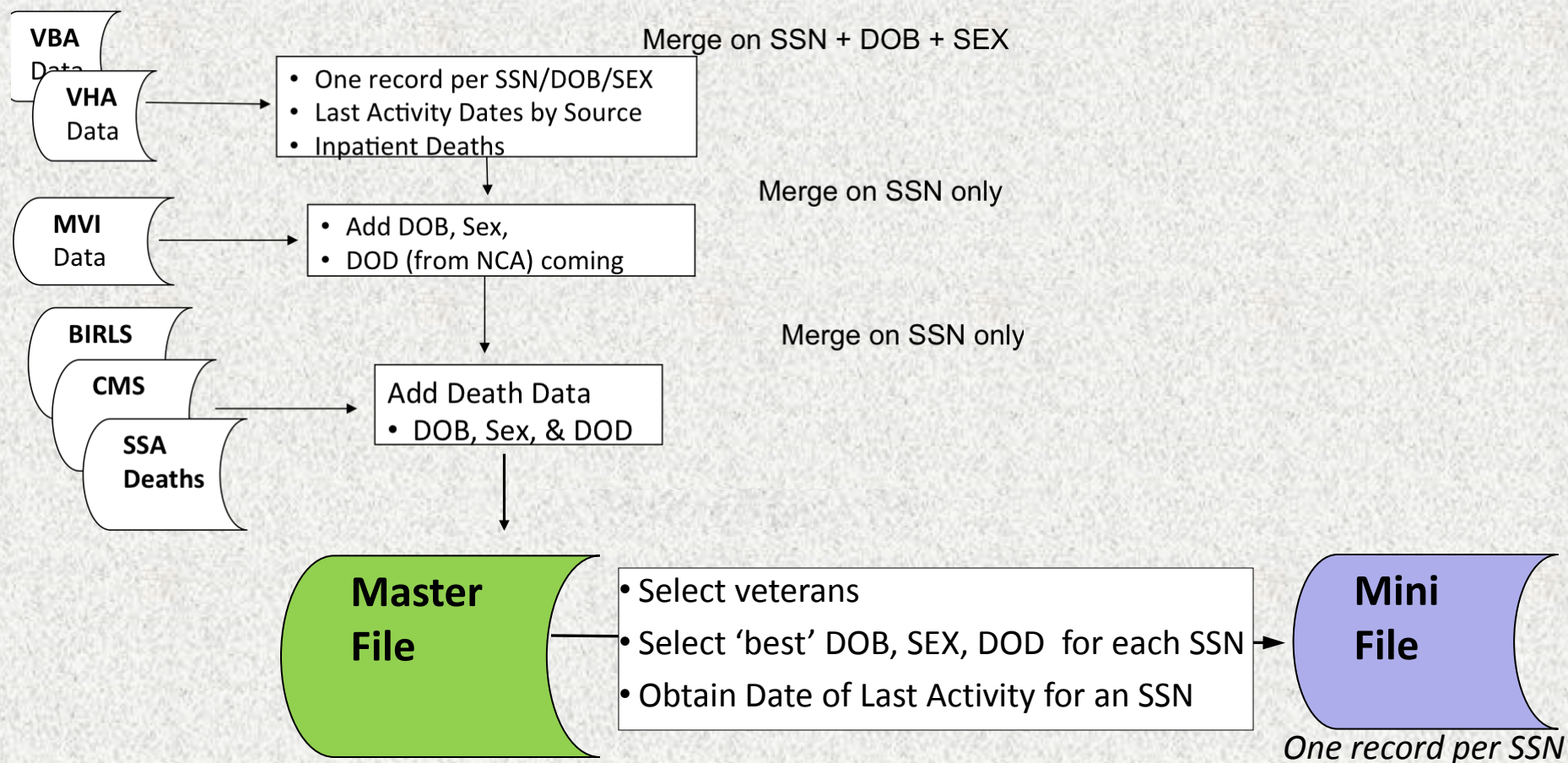
■ CMS information

- Race
- Submission flag by year (CMS_INDYY)
 - 0 = 'Not Submitted'
 - 1 = 'Submitted/Not Enrolled'
 - 2 = 'Submitted/Enrolled'

■ Quality of the date

- Indicates if full or partial data present in source (e.g., month, day, and year present; only year present, etc.)
- 'Complete' includes default values

Construction of the Mini File



Construction of the Mini File

- **Select only Veteran records**
- **Scenario 1: One record for an SSN on the Master File**
 - Use DOB and Sex on record
 - Use 'best' DOD on record
- **Scenario 2: Multiple records for an SSN on the Master File**
 - Multiple DOB/Sex combinations
 - Select 'best' DOB/Sex from all records
 - Select 'best' DOD from all records

What is 'Best'?

- **Use of an algorithm to select the value for a demographic variable (DOB, DOD, Sex) associated with an SSN when more than one value for that variable is found in the source data**
- **Goal is to select the true value for the variable in the majority of cases**

Selecting 'Best' Dates

■ Scenario 2: Multiple records for an SSN on the Master File

- **Select 'best' date of birth** for each SSN among the SSN/DOB/Sex combinations
 - Select 'best' utilization DOB date
 - Based on scoring method (Score range: 0 to 40)
 - » Priority: PTF, Encounter, DSS, FEE
 - » Extra points if complete date, sex present, matches BIRLS, SSA or Medicare
 - See Appendix B for selection routine from all DOB sources (Utilization, Medicare, SSA, BIRLS, Enrollment, VBA C&P)

Selecting 'Best' Dates

■ Scenario 2: Multiple records for an SSN on the Master File

- **Select 'best' Sex** for each SSN among the SSN/DOB/Sex combinations
 - Similar to selection of best DOB
- **Select 'best' date of death** among the SSN/DOB/Sex combinations
 - Select inpatient DOD if present (PTF or FEE)
 - See Appendix A for selection routine from all DOD (Inpatient, Medicare, SSA, BIRLS)

Coming! – **NCA-sourced DOD trumps algorithm-selected best DOD if MVI has complete DOB and gender.**

Contents of the VHA VSF Mini File

- **One record per SSN**
- **'Best' DOB, Sex, DOD**
- **Last health care utilization date**
- **Last activity date**
- **Presumed living status**
- **Source indicators**
 - DOB, DOD, and utilization dates

Master Veteran Index & 'Best' DOB Source

- **MVI DOB replaces algorithm-derived 'best' DOB if MVI DOB is complete.**

- **VHA Directive 1906**

"The MVI is the authoritative identity service within VA maintaining and synchronizing identities for VA clients, Veterans, and beneficiaries (see subpar. 5g). AUTHORITY: Title 38 United States Code (U.S.C.) 7301(b).

- **Recent analysis by NDS:**

- < 2% of records changed from other source DOB to MVI DOB actually changed DOB

Master Veteran Index and 'Best' DOB Source

■ 'Best' DOB Source (VSF Mini created 5/5/2014)

Source	Count	Percent
BRL	1,702	0.0%
CMS	509,642	3.2%
DSS	14,311	0.1%
ENC	526,410	3.3%
ENR	134,995	0.9%
FEE	7,784	0.1%
MVI	14,098,955	89.5%
PTF	169,333	1.1%
SSA	30,335	0.2%
VBA	249,871	1.6%
Total	15,743,238	100.0%

Contents of the Mini File

■ Last activity dates

- 1) Utilization (health care)
- 2) All activity (health care and benefits)
- From all SSN/DOB/Sex combinations for an SSN

■ Presumed living status⁷

- '0': no death date
- '1': death date
- '2': death date and health care usage more than 31 days after death

Session Topics

- **Data sources for Veteran vital status ascertainment**
- **VHA Vital Status Files structure and contents**
- **Challenges in using the VHA VSF and potential strategies for addressing them**
- **Where to go for more help**

Potential Challenges

- **Demographics do not match**
- **Multiple dates of death**
- **Activity after date of death**

Multiple (Master File) Records

Master File created 5/5/2014:

- **25.5 million records***
- **17.8 million SSNs**
- **62% of SSNs have one record**
- **38% with multiple records**

*Includes ~3.0 million non-Veteran records



DOB-Sex Combinations

- **Multiple records occur when there is >1 DOB-Sex combination for an SSN in base data sources**
- **Mismatches arise from**
 - Missing or incomplete dates
 - Conflicting information
- **Default values in place of missing data**
 - Some sources use "1" for day and "January" for month

Multiple Records

DOB-Sex Combinations

VIREC Data Investigation: VSF DOB and Sex Quality*	
Records	19,869,512
SSNs	14,009,035
> 1DOB	36.0%
> 1Gender	1.4%
SSNs with conflicting DOB and/or gender [†]	1,199,045 (8.6%)
Conflicting DOB and gender	2.2%
Conflicting DOB only	14.7%
Conflicting gender only	83.1%

* Veteran records in the VSF created on 12/12/2010 were used in this investigation.
Report available at <http://vaww.virec.research.va.gov>.

[†] Some conflicting due to incomplete dates.

Multiple Dates of Death

■ Sources of 'Best' DOD selected for Mini File

Source	Count	Percent
Medicare Vital Status	3,471,001	62.9%
SSA Death Master	1,104,352	20.0%
Patient Treatment File	721,494	13.1%
BIRLS Death File	133,729	2.4%
Fee Basis	85,514	1.6%
Total Deaths	5,516,090	100.0%

* Data from VSF Mini created on 5/5/2014

Activity After Death

■ VSF Mini Best DOD

- 20.5% of records with a DOD have healthcare or benefit activity after death (ACT_LAST_DT)
 - 7.8% of records with a DOD have activity more than 31 days after death
- 12.0% have healthcare activity after date of death
- 0.68% have Medicare activity (excluding DME, unpaid Carrier claims) after date of death

* Data from VSF Mini created on 5/5/2014

Activity After Death

CMS Activity After Date of Death (Best DOD)*

Days after DOD	Count	Percent
None	2,801,886	98.78%
< 1 month	27,741	0.98%
1 - 3 months	496	0.02%
3 - 12 months	341	0.01%
>12 months	6,020	0.21%
Total	2,836,484	100.00%

* Data from VSF Mini created on 5/5/2014
Death dates 12/31/2010 or earlier
CMS claims data through 12/31/2011

CMS Activity >12 Months After Death

Data Sources for CMS Activity >12 Months After Death*			
Best DOD Source	Count	Percent of AAD [†]	Percent of Best DOD
BIRLS	4,256	70.70%	2.4%
Medicare	446	7.41%	62.9%
FEE	143	2.38%	1.6%
PTF	1,084	18.01%	13.1%
SSA	91	1.51%	20.0%
Total	6,020	100%	100%

* Data from VSF Mini created on 5/5/2014
Death dates 12/31/2010 or earlier
CMS claims data through 12/31/2011

[†] AAD: Activity after death



CMS Activity >12 Months After Death

Age at Death for CMS Activity After Death *

Age at Death	All	AAD≤12M	AAD>12M
0-45	12,643 (0.4%)	190 (0.7%)	738 (12.3%)
46-65	234,827 (8.3%)	2,883(10.1%)	2,409 (40.0%)
> 65	2,589,014 (91.3%)	25,505 (89.2%)	2,873 (47.7%)
Total	2,836,484 (100%)	28,578 (100%)	6,020 (100%)

* All subjects, subjects with AAD ≤ 12 Months, and subjects with AAD >12 Months

Data from VSF Mini created on 5/5/2014

Death dates 12/31/2010 or earlier

CMS claims data through 12/31/2011

AAD: Activity after death

CMS Activity >12 Months After Death

Age at Death for CMS Activity After Death *		
Age at Death	BRL-DOD	Other-DOD
0-45	649 (15.2%)	89 (5.0%)
46-65	1,834 (43.1%)	575 (32.6%)
> 65	1,773 (41.7%)	1,100 (62.4%)
Total	4,256 (100%)	1,764 (100%)

* Data from VSF Mini created on 5/5/2014
Death dates 12/31/2010 or earlier
CMS claims data through 12/31/2011

Matching Cohort to VSF

■ Decisions

- Use Mini File?
- Use Master File?
- Match on SSN + DOB + Sex?
 - All must match?
 - Partial match (e.g., just year and sex)?

■ Possible Issues

- Demographics do not match
- Activity after date of death

Points to Consider

- **You may find inconsistencies between VHA VSF demographics and your cohort demographics**
- **To resolve these inconsistencies the Master file will be useful**
- **Note: VHA VSF should not be used for business operations regarding individual veterans**

Possible Strategy

- **Use the Mini File for the initial search for deaths**
 - Match on SSN
- **Use the Master File to investigate unusual cases, for example:**
 - Cohort DOB/Sex do not match Mini DOB/Sex
 - May be records on the Master File with matching demographics
 - Activity after death
 - Check DOB/Sex for DOD sources on Master File
 - Are all DOD on Master File the same?

Possible Strategy

■ Consider additional supplementary data sources

- Use the NDI or State Vital Statistics Offices for cases lost to follow up, i.e.,
 - No death date
 - No VHA or VBA activity after end of follow up
- CDW for individuals without activity after 1991 or very recent deaths

Session Topics

- **Data sources for Veteran vital status ascertainment**
- **VHA Vital Status Files structure and contents**
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- **Where to go for more help**

Help

■ National Data Systems

- Dorothea Garrett (Dorothea.Garrett@va.gov)

■ VIREC Website Resources

<http://www.virec.research.va.gov>

- Information on VA data sources and how to access data
- Documentation on some VA datasets

Help (cont'd)

HSRData Listserv

- Join at the VIREC Web site
- Discussion among >850 data stewards, managers, and users
- Past messages in archive (on intranet)

VIREC Help Desk

- VIREC staff will answer your question and/or direct you to available resources on topics
- VIREC@va.gov
- (708) 202-2413



Questions?

References

1. Hill ME, Rosenwaike I. The Social Security Administration's Death Master File: the completeness of death reporting at older ages. *Soc Secur Bull* 2001;64:45-51.
2. Social Security Administration Preliminary Observations on the Death Master File, Statement of Daniel Bertoni, Testimony Before the Committee on Homeland Security and Governmental Affairs, U.S. Senate, United States.
3. U.S. Department of Veterans Affairs. *VHA Directive 1906 Data Quality Requirements for Healthcare Identity Management and Master Veteran Index Functions*. April 29, 2013.
4. Doody MM, Chimes K. The Social Security Administration "presumed living" search. *Am J Public Health* 2000;90:1948-1949.

References

5. Savas LS, del Junco DJ, Bastian LA, Vernon SW. Mortality ascertainment of women veterans: a comparison of sources of vital status information, 1979-2002. *Med Care* 2009;47:125-128.
6. Sohn MW, Arnold N, Maynard C, Hynes DM. Accuracy and completeness of mortality data in the Department of Veterans Affairs. *Popul Health Metr* 2006;4:2.
7. Arnold N, Sohn M, Maynard C, Hynes DM. *VIREC Technical Report 2: VA NDI Mortality Data Merge Project*. April 9, 2006. VA Information Resource Center. Available: <http://www.virec.research.va.gov/Reports/TR/TR-VA-NDI-Mortality-CY06-ER.pdf>

Appendix A

Best Date of Death for VHA Vital Status File

1. If all sources (Inpatient, BIRLS, Medicare, SSA) have a different date:

- If complete inpatient death date present use inpatient death date ; otherwise
- If Medicare death date present and the day was not equal to 28, 30, and 31, use the Medicare date; otherwise
- If SSA death date present and the day is not equal to 00, 01, and 15, use the SSA date; otherwise
- If BIRLS death date present use the BIRLS date; otherwise
- If Medicare death date present and the day equals 28, 30, or 31 use the Medicare date; otherwise
- If SSA death date present, use the SSA date.

2. If all sources have a date and the external dates (SSA and Medicare) matched and the internal dates (Inpatient and BIRLS) matched but the external dates did not match the internal dates, use the inpatient death date.

3. If the external sources only had matching dates:

- If an inpatient death date is present, use the inpatient death date; otherwise
- Use the external date.

4. If the internal sources only had matching dates use the internal source.

5. If an external source matches an internal source:

- Use the inpatient death date if the external source matches the inpatient death date; otherwise

6. If BIRLS date is present, use the BIRLS date; otherwise

7. If the FEE date is present, use the FEE date.

Appendix B

Best Date of Birth for VHA Vital Status File

1. If all sources had a different date:

- If a complete **Utilization** birth date present, use the Utilization date (highest scoring Utilization birth date); otherwise
- If **Medicare** birth date present, use the Medicare date; otherwise
- If **SSA** birth date present , use the SSA date; otherwise
- If **Enrollment** birth date present, use the Enrollment Date
- If **BIRLS** birth date present, use the BIRLS date; otherwise
- If **VBA (C&P Mini)** birth date present, use the VBA date; otherwise
- Use incomplete Utilization birth date.

2. If all sources have a date and the external dates (SSA and Medicare) matched and the internal dates (Utilization, BIRLS, VBS and Enrollment) matched but the external dates did not match the internal dates, use the internal birth date.

3. If the external sources only had matching dates:

- If a complete Utilization birth date present, use the Utilization date; otherwise use the external date.

4. If the internal sources only had matching dates use the internal date.

5. If an external source matches an internal source:

- Use the Utilization birth date if the external source date matches the Utilization date; otherwise

6. If BIRLS birth date present, use the BIRLS date; otherwise

7. If VBA (C&P Mini) birth date present, use the VBA date; otherwise

8. Use incomplete Utilization birth date.

